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UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
Technical Standards Committee "A"

Supplement No. 2, January 1987, to
REA Bulletin 43-5, List of
Materials Acceptable for Use on
Systems of REA Electrification Borrowers

The attached pages for the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of October through December 1986. The following changes should be made in order to keep it up to date. Pages with a comma between are on the same sheet, both being changed.

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Conditional List
1(1.1)
January 1987

1 - Clamp, deadend

DISTRIBUTION

2-Bolt Straight Line, Aluminum Alloy

| <u>Manufacturer</u> | <u>Meeting No. and Date</u> | <u>Conditions</u> |
|--|----------------------------------|--|
| *C & R Products | | |
| Catalog No. CRDE-10-180 (No. 4 thru No. 2/0 ACSR) | 918 (5/15/69) 1331 (11/20/86) | (a) To obtain experience. (b) Applications limited to replacements under hot line conditions. |
| Catalog No. CRDE-20-180 (No. 3/0 and No. 4/0 ACSR) | | |
| *Fargo | | |
| Aluminum alloy deadend Catalog No. GD-961A side opening keeper (No. 4 and No. 2 ACSR) | 1258 (5/5/83) 1144 (8/3/78) | Same as above. |
| Catalog No. GD-972A (2/0, 3/0, 4/0 ACSR) | 791 (4/30/64) | |

*Straight line deadend clamps are applicable for urban construction where tensions are moderate and on lines often worked hot.

m-1
July 1986

m - Clamp, suspension

2 BOLT - DISTRIBUTION

| | Copper & CWC | ACSR with 4 | Straight or 2 | Formed 1/0 & 2/0 | Armor Rods 3/0 & 4/0 |
|---------------------------|--------------|-------------|---------------|------------------|----------------------|
| American Connector | FLS-53 | ALS-62 | ALS-62 | ALS-86 | ALS-105 |
| Anderson/Square D | MS-46-N | MS-60-N | MS-70-N | HAS-85-N | HAS-104-N |
| Barron Bethea | FWG-1 | FWG-2 | FWG-3 | FWG-4 | - |
| Bethea Electrical | FS-46-N | GW-1-N | LS-0-N | LS-1-N | LS-2-N |
| Brown Boveri Elec. | 6240 | 6241 | 6242 | 6243 | 6244 |
| C & R Products | - | - | - | CRSC-1 | CRSC-2 |
| Continental Electric | FSC-46-N | FSC-60-N | SC-70-N | SC-85-N | SC-105-N |
| Dulmison | - | - | - | - | AGS* |
| Joslyn (Brewer Titchener) | 6240 | 6241 | 6242 | 6243 | 6244 |
| Lapp | 305740N | 306027N | 306028N | 306029N | 306030N |
| Ohio Brass | 83044 | 83064 | 83074 | 83084 | 83104 |
| Preformed | - | - | - | - | AGS* |

*Accepted for larger sizes.

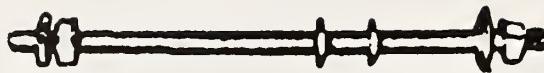
Conditional List
p(1)
January 1987

p - Connectors

| <u>Manufacturer</u> | <u>Meeting No. and Date</u> | <u>Conditions</u> |
|--|-------------------------------------|---|
| <u>Anderson/Square D</u> Compression al to al al to cu "Versa-Crimp" L tap. | 748 11/1/62 | To obtain experience |
| Parallel groove, aluminum LC-52C (1/0 - 6/1 ACSR over armor rods) LC-51C (1/0 - 6/1 ACSR) | 738 6/21/62 | " " " |
| <u>Burndy</u> Compression, insulated "Insulink" | 672 8/6/59 | " " " |
| <u>Blackburn</u> Compression, insulated service entrance con- nectors, Types ICS-1 and IKL | 1027 10/11/73 1133 2/16/78 | " " " |
| Bolted, insulated IPC 1102 (#2-1/0 run, #2 tap) IPC 4111 (1/0-4/0 run, #2-1/0 tap) IPC 4141 (1/0-4/0 run, 1/0-4/0 tap) | 1327 9/11/86 1330 10/30/86 | <ol style="list-style-type: none"> 1. For use on 600 volt maximum insulated conductors. 2. To be used only for connecting service drop conductors to service entrance conductors. 3. To obtain experience. |
| <u>Homac</u> Compression, Insulated "Shure Splicers" Types Q1N and U1N | 1074 9/25/75 1269 11/17/83 | " " " |

q
July 1986

q - bolt, double upset



Applicable Specification: "REA Specifications for Single and Double Upset Spool Bolts," D-5

| Diameter, inches | 5/8 <u>7</u> | 5/8 <u>8</u> | 5/8 <u>9</u> | 5/8 <u>10</u> |
|-------------------|-----------------|-----------------|-----------------|------------------|
| Chance | - | 7826 | 7828 | 7830 |
| Dixie | D7824 | D7826 | D7828 | D7830 |
| Joslyn | - | J2394 | J2395 | J2396 |
| Kortick | K4760 | K4761 | K4762 | K4763 |
| McGraw-Edison* | | DC3E11 | DC3E12 | DC3E13 |
| Utilities Service | 31065 | 31067 | 31069 | 31071 |

*Static proof" designs available.

**an = Transformers, Power
Three-Phase, Step-Down
For Distribution Substation Use**

| Primary Voltage-kV | kVA | | | | MVA | | | | | | | | | |
|-----------------------|-----|------|------|------|------|------|---|-----|----|----|----|----|----|----|
| | 750 | 1000 | 1500 | 2000 | 2500 | 3750 | 5 | 7.5 | 10 | 12 | 15 | 20 | 25 | 30 |
| McGraw-Edison | | | | | | | | | | | | | | |
| 34.4 | x | | x | x | x | | x | x | x | x | x | x | x | |
| 43.8 | x | x | x | x | x | | x | x | x | x | x | x | x | |
| 67.0 | x | | x | x | x | | x | x | x | x | x | x | x | |
| 115 | | | | | | | x | x | x | x | x | x | x | |
| 138 | | | | | | | x | x | x | x | x | x | x | |

Transformers 5 MVA and larger also accepted as load tap changing transformers using McGraw-Edison Types 550, 550B, and 550C load tap changers.

ASEA Electric

| | | | | | | | | | | | | | |
|------|---|--|---|---|---|--|---|---|---|---|---|---|---|
| 34.4 | x | | x | x | x | | x | x | x | x | x | x | x |
| 43.8 | | | x | x | x | | x | x | x | x | x | x | x |
| 67.0 | x | | x | x | x | | x | x | x | x | x | x | x |
| 115 | | | x | x | x | | x | x | x | x | x | x | x |
| 138 | | | | | | | x | x | x | x | x | x | x |

Transformers 5 MVA also accepted as load tap changing transformers using ASEA Electric Type UZD load tap changers.

Westinghouse

| | | | | | | | | | | | | | |
|------|---|---|---|---|---|--|---|---|---|---|---|---|---|
| 34.4 | x | | x | x | x | | x | x | x | x | x | x | x |
| 43.8 | x | x | x | x | x | | x | x | x | x | x | x | x |
| 67.0 | x | | x | x | x | | x | x | x | x | x | x | x |
| 115 | | | x | x | x | | x | x | x | x | x | x | x |
| 138 | | | | | | | x | x | x | x | x | x | x |

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse Types UTI-A, UTI-B and UVW load tap changers.

Conditional List
an(1.1)
January 1987

an - Transformers, Distribution, Pole Type

| <u>Manufacturer</u> | <u>Meeting No. and Date</u> | <u>Conditions</u> |
|---|---------------------------------|-----------------------|
| <u>Dowzter</u> | | |
| 14.4/24.9 kV and Dual Voltage | 824 9/19/65 | To obtain experience. |
| Conventional, single bushing Type CR | 1011 3/1/73 | |
| Self-protected, single bushing Type CSP-R | | |
| Conventional, two bushing Type CD | | |
| <u>General Electric</u> | | |
| 7.2/12.5, 7.62/13.2, 14.4/24.9 kV and Dual Voltage | | |
| Single-phase, single bushing, and two bushing with internal Tranquell Under-oil Arrester | 1316 3/6/86 | To obtain experience. |
| Single-phase, single bushing and two bushing, 25 and 50 kVA pole type distribution transformers with amorphous metal cores | 1320 5/8/86 | To obtain experience. |
| <u>Tarrant</u> | | |
| 7.2/12.5 kV and 7.62/13.2 kV | 791 4/30/64 | To obtain experience. |
| Conventional, single bushing Type CB-1 | | |
| Conventional, two bushing Type CB-2 | | |
| Self-protected, single bushing Type SG-1 | | |
| May also be obtained with lightning arrester and internal fuse. Types PSG-1 and PSG-2. | | |

Conditional List
an(1.2)
January 1987

an - Transformers, Distribution, Pole Type

| <u>Manufacturer</u> | <u>Meeting No. and Date</u> | <u>Conditions</u> |
|---|---------------------------------|-----------------------|
| <u>VanTran</u> 14.4/24.9 kV and Dual Voltage | 1075 10/16/75 | To obtain experience. |
| Conventional, single bushing Type CR | | |
| Conventional, two bushing Type CD | 1095 8/11/76 | |
| Self-protected, single bushing Type CSP-R | | |
| <u>Westinghouse</u> 7.2/12.5, 7.62/13.2 | 1333 12/18/86 | To obtain experience. |
| Single-phase, single bushing, 25 kVA pole type distribution transformers with amorphous metal cores. | | |



bb
July 1986

bb - Brace, sidearm vertical

26" brace 50" brace
24" bolt-hole spacing 24" bolt-hole spacing

| | | |
|-------------------|-------|-------|
| Dixie | D6986 | D6987 |
| Joslyn | J1536 | J1537 |
| Kortick | K1931 | K1932 |
| McGraw-Edison | DB1V1 | DB1V3 |
| Utilities Service | 5249 | 5250 |

Conditional List
be(1)
January 1987

be - Recloser, oil circuit
12.5/7.2 kV

| <u>Manufacturer</u> | <u>Meeting No. and Date</u> | <u>Conditions</u> |
|---|---|------------------------------------|
| <u>*Lexington Switch and Controls</u> | | |
| Three phase oil circuit recloser, 50, 100 and 280 ampere frames, A Line, Model 3B (5-5- Amperes) | 808 (1/7/65) 1087 (4/1/76) 1329 (10/9/86) | To obtain operating experience. |
| Model 3D (5-100 Amperes) | | |
| Model 3K (25-28 Amperes) | | |
| <u>*Westinghouse</u> | | |
| Three phase oil circuit recloser (Shunt trip with static or relay type controls) | | To obtain operating experience. |
| Type ES-400 (15-400 amperes) | 1070 (7/24/75) | |
| Type ES-560 (15-560 amperes) | | |
| Type ESM-560 (100-560 amperes) | | |
| Type ES-105 (15-560 amperes) | 1077 (11/13/75) | |
| <u>24.9/14.4 kV</u> | | |
| <u>*Lexington Switch and Controls</u> | | |
| Oil circuit recloser, Single phase-A Line, Model M rated 100 amperes | 620 (4/18/57) 1080 (12/23/75) | To obtain operating experience. |
| Three phase-A Line, Model 3M rated 100 amperes | 1329 (10/9/86) | |

*Ratings greater than 100 amp. for 12.5/7.2 kV application, and greater than 200 amp for 24.9/14.4 kV application, are acceptable only with ground trip devices.

be-2
July 1986

be - Reclosers, Vacuum interrupter
12.5/7.2 kV

McGraw-Edison

*#Three phase - Type VSA, ratings
100 - 560 amperes

* Ratings greater than 100 amp. for 12.5/7.2 application, and greater than 200 amp. for 24.9/14.4 kV application, are acceptable only with ground trip devices.

#Not acceptable with load current, bushing CT battery chargers.

be - Recloser, oil circuit
12.5/7.2 kV

Lexington
Switch and
Controls

Single phase - A Line, Model B, ratings 5-50 amperes,
maximum interrupting capacity 1250 amperes.
Single phase - A Line, Model D, ratings 25-100 amperes,
maximum interrupting capacity 2000 amperes.
Single phase - A Line, Model K, ratings 25-100 amperes,
maximum interrupting capacity 4000 amperes.

McGraw-Edison

Single phase - Type H, ratings 5-50 amperes, maximum
interrupting capacity 1250 amperes.
Single phase - Type 4H, ratings 5-100 amperes, maximum
interrupting capacity 2500 amperes.
Single Phase - Type L, ratings 25-100 amperes, maximum
interrupting capacity 2500 amperes.
Three phase - Type 6H, ratings 5-100 amperes, maximum
interrupting capacity 2500 amperes.
*Three phase - Type RX, ratings 25-400 amperes, maximum
interrupting capacity 6000 amperes.
*Three phase - Type W, ratings 100-560 amperes,
maximum interrupting capacity 10,000 amperes.
*#Three phase - Type RXE, rating 400 amperes, maximum
interrupting capacity 6000 amperes.
*#Three phase - WE, rating 560 amperes, maximum
interrupting capacity 10,000 amperes.
*#Three phase - ME, ratings 560 or 1120 amperes,
maximum interrupting capacity 16,000 amperes.

24.9/14.4 kV

McGraw-Edison

Single phase - Type E, rating 5-100 amperes, maximum
interrupting capacity 2500 amperes. Available with
shunt lockout solenoid for three-phase operation.
*#Three phase - Type RVE, rating 400 amperes, maximum
interrupting capacity 6000 amperes.
*Three phase - Type WV, ratings 560 amperes, maximum
interrupting capacity 8000 amperes.
*#Three phase - type WVE, rating 560 amperes, maximum
interrupting capacity 8000 amperes.
*Single phase - Type 4E, rating 50-280 amperes, maximum
interrupting capacity 4000 amperes.
*#Three phase - Type CXE, rating 560 amperes, maximum
interrupting capacity 16,000 amperes, maximum voltage 34.5 kV

* Ratings greater than 100 amp. for 12.5/7.2 kV application, and greater than
200 amp. for 24.9/14.4 kV application, are acceptable only with ground trip
device.

Not acceptable with load current, bushing Ct battery chargers.

ej - Clamps, deadend with socket eye

| | <u>AWG</u> | <u>2/0 to 4/0</u> | <u>266.8</u> | <u>336.4</u> | <u>477</u> | <u>kamil</u> | <u>556.5</u> | <u>795</u> | <u>954</u> |
|---|------------|-------------------|--------------|--------------|------------|--------------|--------------|------------|------------|
| <u>ACSR</u> | | | | | | | | | |
| <u>Iron or Steel Clamps (require armor tape or liner)</u> | | | | | | | | | |
| Joslyn (Brewer-Titchener) | 5001 | | 5002 | 5002 | | 5003 | -- | -- | -- |
| Ohio Brass | 80440 | | 80445 | 80445 | | 80450 | -- | -- | -- |
| <u>Aluminum Alloy Clamps (do not require armor tape or liner)</u> | | | | | | | | | |
| Anderson/Square D | SD-57-S | | SD-70-S | SD-86-S | SD-98S | -- | | | |
| Bethlea Electrical | ADE-21-S | | ADE-22-S | ADE-23-S | ADE-24-S | -- | | | |
| C & R | CR-10-60S | | CR-20-60S | CR-20-60S | -- | -- | | | |
| Joslyn (Brewer Titchener) | 5200 | | 5201 | 5202 | 5203 | -- | | | |
| Lapp | 305757S | | 305758S | 305759S | 305760S | -- | | | |
| Ohio Brass | 86536 | | 86540 | 86546 | 86546 | -- | | | |

NOTE: When used with clevis-type insulators for large conductors on distribution lines, order clamp with clevis eye.

ek
July 1986

ek - Locknuts

| For Bolt Diam., in.: | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 |
|----------------------|-------|-------|-------|-------|-----------|
| <u>MF Type</u> | | | | | |
| Chance | 3510 | 3511 | 3512 | 3513 | 3514 |
| Dixie | D3510 | D3511 | D3512 | D3513 | -- |
| Hughes Brothers | MF30 | MF50 | MF60 | MF70 | -- |
| Joslyn | J8581 | J8582 | J8583 | J8584 | J8584-1/2 |
| Kortick | K1065 | K1066 | K1067 | K1068 | -- |
| McGraw-Edison | DF3N1 | DF3N2 | DF3N4 | DF3N6 | DF3N8 |
| Power Line Hardware | SLN38 | SLN50 | SLN58 | SLN34 | SLN78 |
| Utilities Service | 4920 | 4921 | 4922 | 4923 | 4924 |

sb - Switch, disconnect (single-pole, hook operated distribution class)*

For distribution line use where power class insulation is not required and single-phase switching is permissible.

(Not suitable for substation use)

| <u>Manufacturer</u> | <u>Type</u> | <u>Voltage Rating</u> | <u>System Voltage Line-to-Line</u> |
|------------------------|-------------|-----------------------|------------------------------------|
| Chance | M3(PL) | 15 and 27 kV | 12.5 thru 24.9 kV |
| G & W Electric Company | EV(PL) | 15 kV | 12.5 kV |
| Kearney | D-73(PL) | 15 and 25 kV | 12.5, 13.2, 24.9 kV |
| McGraw-Edison | D2(PL) | 15 and 25 kV | 12.5, 13.2, 24.9 kV |
| Morgan | DHS (PL) | 15 and 23 kV | 12.5, 13.2, 24.9 kV |
| ITT Royal | BLT(PL) | 15 and 23 kV | 12.5, 13.2, 24.9 kV |
| S & C | LBD (PL) | 15 and 25 kV | 12.5, 13.2, 24.9 kV |
| Siemens-Allis | HD(PL) | 15 and 25 kV | 12.5 thru 24.9 kV |

NOTE: Switches on this page must be furnished with four bolts for double crossarm mounting.

(L) Means solid material load interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

(LV) Means vacuum interrupters are available and accepted.

*Steel bases only.

Conditional List
sb(1)
January 1987

sb - Switch, hookstick
(line tension switches)

for use on 12.5/7.2 kV systems only

| <u>Manufacturer</u> | <u>Meeting No. and Date</u> | <u>Conditions</u> |
|-----------------------------|-----------------------------|-----------------------|
| <u>Blackburn</u> IL6B-H | 1332 (12/4/86) | To obtain experience. |
| <u>Bridges</u> 125 | 1279 (5/3/84) | To obtain experience. |
| <u>Chance</u> LTD06150-H | 1279 (5/3/84) | To obtain experience. |

NOTE: All switches listed on this page have hooks for portable load
interrupters.

Conditional List

sc

July 1986

sc - Regulators, Voltage

| <u>Manufacturer</u> | <u>Meeting No. and Date</u> | <u>Conditions</u> |
|--|---------------------------------|-----------------------|
| <u>Siemens-Allis</u> Three-phase, step-type substation regulator Type SFR (13.2/7.62 kV) | 657 (11/24/58) | To obtain experience. |
| <u>General Electric</u> Three-phase, step-type substation regulator Type TMLT-32 (13.2/7.62 kV) | 723 (9/28/61) | To obtain experience. |

sd
January 1987

sd - Current Transformers
Outdoor Type

| <u>Manufacturer</u> | <u>.6 kV</u> | <u>15 kV</u> | <u>25 kV</u> | <u>34.5 kV</u> | <u>69 kV</u> |
|--|----------------------------------|------------------|----------------------------|----------------------------|-------------------|
| Andover | DCBW DCCW DCAB | | | | |
| Associated Engineering | GT HA WEQ | BB-15 LG-15 | BB-25 LG-25 COF | LG-34.5 COF | COF-350 |
| Astra | AA TFW AB AD | | | | |
| Electromagnetic Industries (Square D) | | C03-110 | C03-150 | C03-200 | 1K-350 |
| General Electric | JCR-0 JCW-0 JAK-0 JAD-0 | JKW-5 JCK-5 | JKW-6 JKW-150 KG-150 | JKW-7 JKW-200 KG-200 | JKW-350 KG-350 |
| Sangamo | R6S R6SA R6M | | | | |
| Westinghouse | CSF/CMS CMF CLC/CLE | KOR-11 KON-11 | ACT-150 KOR-15 | ACT-200 | ACT-350 |

NOTE: The transformer types listed above are accepted in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

Conditional List
sd
October 1986

sd - Current Transformers
Outdoor Types

| <u>Manufacturer</u> | <u>Meeting No. and Date</u> | <u>Conditions</u> |
|--|---------------------------------|-----------------------|
| <u>Electromagnetic Ind. (Square D)</u> | | |
| Type UMCT, 0.6 kV | 971(7/15/71) | To obtain experience. |
| Type UCT, 0.6 kV | | |
| Type IK 4-350-69, 69 kV (cycloaliphatic resin bushings) | 1325 (8/14/86) | |
| <u>Balteau Standard</u> | | |
| Type KEWO-110, 15 kV | 1212 (5/21/81) | To obtain experience. |
| Type KEWO-150, 25 kV | | |
| Type KEWO-200, 34.5 kV | | |
| Type KEWO-350, 69 kV | | |

se
January 1987

se - Voltage Transformers

Outdoor Types

| <u>Manufacturer</u> | <u>.6 KV</u> | <u>15 KV</u> | <u>25 KV</u> | <u>34.5 KV</u> | <u>69 KV</u> |
|---------------------------------------|----------------|--------------------------------|----------------------------|----------------------------|--------------------|
| Andover | DVE-6 DVF-6 | | | | |
| Associated Engineering | CL TL | PTT-150 SPOF-100 PTT-110 | PTT-150 SPOF-150 | POF-200 | POF-350 |
| Electromagnetic Industries (Square D) | | PO5-110 | PO5-150 | PO5-200 | U3-350-69 |
| General Electric | JVA-0 JVP-0 | JVW-5 JVW-110 | JVW-6 ET-150 JVT-150 | JVW-7 ET-200 JVT-200 | ET-350 JVT-350 |
| Sangamo | T6A T7 | | | | |
| Westinghouse | PPM | VOG-11 VOZ-11 | PTOM-150 APT-150 | APT-200 | APT-350 LPT-350 |

NOTE: The transformer types listed above are acceptable in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

U an-1.1
January 1987

U an - Transformers, distribution
pad-mounted, dead-front

(For underground application)

Applicable Specifications: "REA Specifications for Pad-Mounted
Transformers," U-5.

| <u>Manufacturer</u> | <u>Single Phase</u> | <u>Three-Phase</u> |
|-------------------------------------|--------------------------------------|----------------------------------|
| Central Moloney (2, 4) | "REA-LP" 25-167 kVA | |
| Dowzer (3, 4) | "METRI-PAD" 25-167 | "PM3W-R" 75-500 KVA |
| ERMCO (2, 4) | "Low-Profile" 10-167 kVA | |
| General Electric (2, 4) | "Mini-Pad III - REA" 10-167 kVA | "Compad II - REA" 75-2500 KVA |
| Howard (2, 4) | "Hi Pad REA" 10-167 kVA | "Hi Pad 3 REA" 45-2500 KVA |
| Kuhlman (2, 4) | "Lo-Pak ELR" 25-167 kVA | "K-PAK-3 REA" 750-2500 KVA |
| McGraw-Edison (2, 4) | Series 20/20 REA 25-167 kVA | "REA Pad-Mount" 75-2500 KVA |
| NECO/Hammond (2) | HMM-R, 10-50 kVA SP-R, 75-167 kVA | TP-R, 45-1000 kVA |
| Pauwels-Chance(2,4) | "Turf-Hugger-R" 10-100 kVA | "Turf-hugger-R" 45-500 KVA |
| H. K. Porter (2, 4) (Delta-Star) | "Low Profile U 5-R" 25-167 kVA | "Porter U5-R3" 225-2500 KVA |
| RTE (2, 4) | "REA Shrubline" 15-167 kVA | "REA Terra-Tran" 45-2500 kVA |
| United (Ky, AEC)(2, 4) | "Pad-Mount" 15-75 kVA | |

- (1) 7.2/12.5 and 7.6/13.2 kV
- (2) 7.2/12.5, 7.6/13.2 and 14.4/24.9 kV
- (3) 7.2/12.5 and 7.6/13.2 kV (conditional listing for 14.4/24.9 kV)
- (4) Dual Voltage - Same as for 14.4/24.9 kV, single phase
- (5) Three-phase listing applies to 7.2/12.5 and 7.6/13.2 kV only
- (6) 14.4/24.9 kV

U an-1.2
July 1986

U an - Transformers, Distribution,
Pad-Mounted, Dead-Front

(For Underground Application)

Applicable Specifications: REA Specifications for Pad-Mounted
Transformers - U5

| <u>Manufacturer</u> | <u>Single Phase</u> | <u>Three-Phase</u> |
|--------------------------|----------------------------|---|
| VanTran (3, 4) | "Mini-Pad U5" 5-167 kVA | "VanTran III-U5" 30-2500 kVA |
| Wagner (Turbodyne)(2, 4) | "Turfline II-R" 25-167 kVA | |
| Westinghouse 2, 4) | "Mini-Pak U-5" 25-167 kVA | Type MTR 75-1500 kVA "Plazapad-U5" 2000-2500 kVA |

- (1) 7.2/12.5 and 7.6/13.2 kV
- (2) 7.2/12.5, 7.6/13.2 and 14.4/24.9 kV
- (3) 7.2/12.5 and 7.6/13.2 kV (conditional listing for 14.4/24.9 kV)
- (4) Dual voltage - same as for 14.4/24.9 kV, single phase
- (5) Three-phase listing applies to 7.2/12.5 and 7.6/13.2 kV only

U hr
July 1986

U hr - Secondary tap or splice cover, submersible

| <u>Manufacturer</u> | <u>Type or Catalog No.</u> |
|------------------------|--|
| Bishop | Splice-Wrap |
| Blackburn | Type WDBS (#2 through #4/0) Type DBS (250 KCMIL through 1000 KCMIL) |
| Connector Mfg. Co. | Utilug Sure Seal |
| Elastimold (ESNA) | Style 86 |
| Electrical Spec. Prod. | TSC Series |
| Homac | FSS Series |
| Kearney | Aqua-Seal Kit |
| 3M | PST Series 8400 |

Heat Shrink Tubing (with sealant throughout)

| <u>Manufacturer</u> | <u>Type or Catalog No.</u> |
|------------------------|------------------------------------|
| AMP | Black heat-shrink tubing |
| Blackburn | HS cable sleeves |
| Electrical Spec. Prod. | HSH |
| Panduit | Heat shrink insulating cover |
| Raychem | WCS cable sleeves |
| Sigmaform Corporation | Sigmaform heat-shrinkable products |

U hv - Cable, Underground
15 kV Cable

Applicable Specification: REA Specification U-1
Conductor: Copper or Aluminum - #2 AWG through 1000 kcmil
Insulation: Crosslinked (XL) Polyethylene, Ethylene Propylene Rubber (EPR), Crosslinked Polyethylene with Tree-retardant additives (XL-TR), or High Molecular Weight Polyethylene with Tree-retardant additives (HMW-TR)
Neutral: Copper Concentric Neutral
Jacket (If Used): High Molecular Weight Polyethylene

| <u>Manufacturer</u> | <u>Insulation(s)</u> | <u>Jacketed Cable Accepted*</u> | <u>Flat Strap Neutral Available</u> | <u>Stabilized Neutral Design**</u> |
|-----------------------|------------------------|---------------------------------|-------------------------------------|------------------------------------|
| Cablec | XL, EPR, XL-TR, HMW-TR | Yes | Yes | R-LOK |
| Conductor Prod. | XL, XL-TR, HMW-TR | Yes | Yes | Ridg-lok |
| Hendrix | XL, EPR, XL-TR, HMW-TR | Yes | No | Neu-lok |
| Okonite | XL, EPR, XL-TR | Yes | Yes | |
| Pirelli | XL, EPR, XL-TR | Yes | Yes | STA-SERVE |
| Reynolds | XL, EPR, XL-TR, HMW-TR | Yes | Yes | Secure-Neutral |
| Rockbestos | XL-TR | No | No | |
| Rome | XL, EPR, XL-TR | No | Yes | Serve-Lock Counter Secure |
| Southwire Furukawa | XL, XL-TR | Yes | No | |

*For grounding purposes insulated jacketed cables must be treated like overhead lines, i.e., at least four ground rods must be installed per mile in accordance with the NES. (This does not include service grounds, etc., but does include equipment grounds.) Additional grounding may be necessary in soils with higher resistivity. In splices or tap connections, a good seal should be achieved to exclude moisture.

**Accepted design meeting the requirements of paragraph 7.5.2. of REA Specification U-1, for a minimum neutral with a maximum lay.

U hv - Cable, Underground
25 kV Cable

Applicable Specification: REA Specification U-1
 Conductor: Copper or Aluminum - #1 AWG through 1000 kcmil
 Insulation: Crosslinked (XL) Polyethylene, Ethylene
 Propylene Rubber (EPR), Crosslinked Polyethylene
 with Tree-retardant additives (XL-TR), or High
 Molecular Weight Polyethylene with Tree-retardant
 additives (HMW-TR)
 Neutral: Copper Concentric Neutral
 Jacket (If Used): High Molecular Weight Polyethylene

| <u>Manufacturer</u> | <u>Insulation(s)</u> | <u>Jacketed Cable Accepted*</u> | <u>Flat Strap Neutral Available</u> | <u>Stabilized Neutral Design**</u> |
|-----------------------|---------------------------|---------------------------------|-------------------------------------|------------------------------------|
| Anaconda Power Cable | XL | No | No | |
| Cablec | XL, EPR, XL-TR, HMW-TR | Yes | Yes | R-LOK |
| Conductor Prod. | XL, XL-TR, HMW-TR | Yes | Yes | Ridg-lok |
| Hendrix | XL, EPR, XL-TR, HMW-TR | Yes | No | Neu-lok |
| Okonite | XL, EPR, XL-TR | Yes | Yes | |
| Pirelli | XL, EPR, XL-TR | Yes | Yes | STA-SERVE |
| Reynolds | XL, EPR, XL-TR, HMW-TR | Yes | Yes | Secure-Neutral |
| Rockbestos | XL-TR | No | No | |
| Rome | XL, EPR, XL-TR | No | Yes | Serve-Lock Counter Secure |
| Southwire Furukawa | XL, XL-TR | Yes | No | |

*For grounding purposes insulated jacketed cables must be treated like overhead lines, i.e., at least four ground rods must be installed per mile in accordance with the NESC. (This does not include service grounds, etc., but does include equipment grounds.) Additional grounding may be necessary in soils with higher resistivity. In splices or tap connections, a good seal should be achieved to exclude moisture.

**Accepted design meeting the requirements of paragraph 7.5.2. of REA Specification U-1, for a minimum neutral with a maximum lay.

U hv-3
July 1986

U hv - Cable, Underground

600 Volt Cable

Applicable Specification: REA Specification U-2
Conductor : Copper, #4 AWG and larger
 : Aluminum, #2 AWG and larger
Insulation : Cross-Linked polyethylene (XLPE)

| <u>Manufacturer</u> | <u>Type Conductor</u> |
|--|-----------------------|
| Alcan | Copper or Aluminum |
| Anaconda Power Cable | Copper or Aluminum |
| Cablec | Copper or Aluminum |
| Collyer | Copper or Aluminum |
| Conductor Products | Aluminum |
| Essex | Copper or Aluminum |
| General Electric | Copper or Aluminum |
| Hatfield | Copper |
| Kaiser | Aluminum |
| Okonite | Copper or Aluminum |
| Phelps Dodge | Copper or Aluminum |
| Phillips Cables, Inc. (Marked "Phillips W") | Copper or Aluminum |
| Pirelli | Copper or Aluminum |
| Reynolds | Copper or Aluminum |
| Rome Cable | Copper or Aluminum |
| Southwire | Copper or Aluminum |

NOTE: The manufacturers shown above have indicated that their 600 volt cable is suitable for use on 480 volt corner grounded delta circuits.

The above cable may be supplied with UL label for Type USE.

U hv - Cable, Underground

600 Volt Multi-Conductor Cable

Applicable Specification: REA Specification U-2
Conductor : Copper, #4 AWG and larger
 Aluminum, #2 AWG and larger
Insulation : Cross-Linked polyethylene (XLPE)
Cable Configuration : 3 Insulated Conductors Triplexed

| <u>Manufacturer</u> | <u>Type Conductor</u> |
|--|-----------------------|
| Alcan | Copper or Aluminum |
| Anaconda Power Cable | Copper or Aluminum |
| Cablec | Copper or Aluminum |
| Conductor Products | Aluminum |
| Essex | Copper or Aluminum |
| General Electric | Copper or Aluminum |
| Hatfield | Copper |
| Kaiser | Aluminum |
| Okonite | Copper or Aluminum |
| Phillips Cables, Inc. (Marked "Phillips W") | Copper or Aluminum |
| Pirelli | Copper or Aluminum |
| Reynolds | Copper or Aluminum |
| Rome Cable | Copper or Aluminum |
| Southwire | Copper or Aluminum |

The above cable may be supplied with UL label for Type USE.

U hw
July 1986

U hw - Warning sign

Applicable Specifications: REA Drawings UM12-1 and UM12-2

| <u>Manufacturer</u> | <u>Size (inches)</u> | <u>Danger Sign Catalog No.</u> | <u>Caution Sign Catalog No.</u> |
|---------------------|----------------------|--------------------------------|---------------------------------|
| Brady* | 7 x 10 | 46133 | 46043 |
| | 10 x 14 | 46131 | 46041 |
| Dun-Lap* | 7 x 10 | DL-D710 | DL-C710 |
| | 10 x 14 | DL-D1014 | DL-C1014 |
| | 14 x 20 | DL-D1420 | DL-C1420 |
| | 20 x 28 | DL-D2028 | DL-C2028 |
| Eastern Metal* | 7 x 10 | REA 12-1-710 | REA 12-2-710 |
| | 10 x 14 | REA 12-1-1014 | REA 12-2 1014 |
| | 14 x 20 | REA 12-1-1420 | REA 12-2-1420 |
| | 20 x 28 | REA 12-1-2028 | REA 12-2-2028 |
| Lyle* | 7 x 10 | UM12-1-710 | UM12-2-710 |
| | 10 x 14 | UM12-1-1014 | UM12-2-1014 |
| | 14 x 20 | UM12-1-1420 | UM12-2-1420 |
| | 20 x 28 | UM12-1-2028 | UM12-2-2028 |
| May Advertising | 7 x 10 | MY710C | MY710B |
| | 10 x 14 | MY1014C | MY1014B |
| | 14 x 20 | MY1420C | MY1420B |
| | 20 x 28 | MY2028C | MY2028B |

For pressure sensitive decal add "D" prefix to catalog number.

| | | | |
|---------------------|---------|----------|----------|
| Truck Sign Service* | 7 x 10 | TSD-710 | TSC-710 |
| | 10 x 14 | TSD-1014 | TSC-1014 |
| | 14 x 20 | TSD-1420 | TSC-1420 |
| | 20 x 28 | TSD-2028 | TSC-2028 |
| Lem | 7 x 10 | LSS-1400 | LSS-1500 |
| | 10 x 14 | LSS-1401 | LSS-1501 |
| | 14 x 20 | LSS-1402 | LSS-1502 |

*Reflective signs also available.

The signs listed on this page are to be secured to equipment and transformer enclosures by means of an adhesive or by welding. Screws and rivets are not to be used.

U sd
July 1986

U sd - Current Transformers
600 Volt

Direct Burial Type

| <u>Manufacturer</u> | <u>Type or Catalog No.</u> |
|---------------------|----------------------------|
| General Electric | JAL-0 |

Indoor Type for Pad-Mounted Transformers

| <u>Manufacturer</u> | <u>Type or Catalog No.</u> |
|---------------------|----------------------------|
| Astra | AP |
| General Electric | JAB-0 |
| Westinghouse | CMV |

U si-1
January 1987

U si - Anodes, Sacrificial
(Drawings UM11-1, UM26, UM27, M2-7, M2-17)

Zinc Anodes*

| | <u>Pre-packaged With Connecting Wire</u> | | | <u>Bare Continuous Strip (Ribbon)</u> | |
|-------------------------------------|--|----------------|----------------|---------------------------------------|---------------------|
| | <u>12 lbs.</u> | <u>30 lbs.</u> | <u>60 lbs.</u> | <u>5/8" x 7/8"</u> | <u>1/2" x 9/16"</u> |
| Federated Metals | S-12 packaged | S-30 packaged | S-60 packaged | Regular Size Type II | Junior size |
| General Cathodic Protection Service | 12HII-4A | 30HII-4A | 60HII-4A | | |
| Harco | AZC12GJ | AZC30GJ | AZC60HJ | | |
| Mesa | S-12 packaged | S-30 packaged | S-60 packaged | Regular Size | Junior size |
| Stuart | SZ-12 -----VIBROX packaged----- | SZ-30 | SZ-60 | | |

*When ordering, specify zinc anodes that meet ASTM B418-73 Type II Composition and REA Specification DT-9, "REA Specification for Zinc Sacrificial Anodes."

U si-2
January 1987

U si - Anodes, Sacrificial
(Drawings UM11-1, UM26, UM27, M2-7, M2-17)

Magnesium Anodes**

| | Standard Potential | | | | High Potential | | | |
|--------------------------------------|--------------------|---------------|---------------|---------------|-------------------------|-------------------------|-------------------------|---------------|
| | <u>17 lbs</u> | <u>20 lbs</u> | <u>32 lbs</u> | <u>50 lbs</u> | <u>17 lbs</u> | <u>20 lbs</u> | <u>32 lbs</u> | <u>48 lbs</u> |
| Federated Metals | 17 packaged | | 32 packaged | 50 packaged | | | | |
| General Cathodic Protection Services | 17 packaged | | 32 packaged | 50 packaged | 17D3 packaged | 20D2 packaged | 32D5 packaged | 48D5 packaged |
| Harco | AMC17J | AMC20J | AMC32J | AMC50J | AMC17G | AMC20G | AMC32G | AMC48G |
| Kaiser Mag. | 17 Vibra Pak | | 32 Vibra Pak | 50 Vibra Pak | 17 Electromag Vibra Pak | 32 Electromag Vibra Pak | 50 Electromag Vibra Pak | |
| Mesa | 17 packaged | | 32 packaged | 50 packaged | 17D Series | 20D2 | 32D Series | 48D5 |
| Stuart | SM-17 | | SM-32 | SM-50 | SM-17H | | SM-32H | SM-48H |

**When ordering, specify magnesium anodes that meet REA Specification DT-10,
"REA Specification for Magnesium Sacrificial Anodes."

